

AMENDMENTS TO THE CLAIMS

1. (Previously presented) A method of fabricating a thermoset article from a mold, comprising:

providing a mold having a metal oxide coating on at least one surface;

treating the mold with a solution comprising an ionic release agent, wherein the solution has a pH that induces an attracting charge on the metal oxide surface, wherein said charge is opposite to the charge of the release agent to bond the release agent to the metal oxide surface;

providing a thermoset resin mixture in the mold; and

curing the resin mixture in the mold.

2. (Original) The method of Claim 1, wherein the mold is a glass substrate comprising silica.

3. (Original) The method of Claim 1, wherein the metal oxide is selected from the group consisting of transition metal oxides and ceramic oxides.

4. (Previously presented) The method of Claim 3, wherein the metal oxide is selected from the group consisting of TiO_2 , TiO , Ti_2O_3 , Ti_3O_5 , SnO , SnO_2 , Al_2O_3 , Al_2O , AlO , ZrO_2 , Ta_2O_5 , HfO_2 , Y_2O_3 , Nb_2O_4 , Nb_2O_5 , NiO , MgO , MgO_2 , Fe_2O_3 , Fe_3O_4 , FeOOH , $\text{Fe}(\text{OH})_2$, Cr_2O_3 , CrO_2 , and CrO_3 or any combination thereof.

5. (Original) The method of Claim 4, wherein the metal oxide is Al_2O_3 .

6. (Original) The method of Claim 4, wherein the metal oxide is NiO .

7. (Original) The method of Claim 4, wherein the metal oxide is MgO .

8. (Original) The method of Claim 4, wherein the metal oxide is SnO₂.
9. (Original) The method of Claim 1, wherein the metal oxide coating is a thin metal oxide layer.
10. (Previously presented) The method of Claim 9, wherein the metal oxide is deposited on the mold by physical vapor deposition or chemical vapor deposition.
11. (Original) The method of Claim 10, wherein the thickness of the thin metal oxide is about 1 to about 2000 nm.
12. (Original) The method of Claim 1, wherein the metal oxide coating is formed by O₂ plasma or atmospheric oxidation.
13. (Previously presented) The method of Claim 1, wherein the metal oxide exhibits an isoelectric point greater than 2.
14. (Original) The method of Claim 13, wherein the metal oxide exhibits an isoelectric point greater than or about equal to 4.
15. (Original) The method of Claim 14, wherein the metal oxide exhibits an isoelectric point greater than or about equal to 8.
16. (Previously presented) The method of Claim 15, wherein the metal oxide exhibits an isoelectric point greater than or about equal to 10.
17. (Original) The method of Claim 16, wherein the metal oxide exhibits an isoelectric point less than or about equal to 12.

18. (Original) The method of Claim 1, wherein the metal oxide exhibits an isoelectric point from about 7 to about 12.5.

19. (Original) The method of Claim 18, wherein the metal oxide is selected from the group consisting of Fe_2O_3 , Fe_3O_4 , FeOOH , and $\text{Fe}(\text{OH})_2$ or any combination thereof.

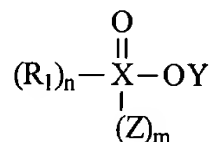
20. (Original) The method of Claim 1, wherein the metal oxide exhibits an isoelectric point from about 6 to about 7.

21. (Original) The method of Claim 20, wherein the metal oxide is selected from the group consisting of CrO_3 , CrO_2 , and Cr_2O_3 or any combination thereof.

22. (Original) The method of Claim 1 wherein the release agent is used as an internal release agent.

23. (Original) The method of Claim 1, wherein the release agent is an anionic compound.

24. (Original) The method of Claim 1, wherein the release agent is a compound with the following general formula:



wherein,

Y is any element or combination of elements that forms an acid conjugate upon dissociation,

X is any element that facilitates the dissociation and formation of a base conjugate with reduced chemical interaction with the resin mixture,

R₁ is any combination of elements that facilitates solubility within the resin mixture and provides a non-reactive barrier film,

n is either 1 or 2,

Z is either O or OH,

m is either 0 or 1.

25. (Original) The method of Claim 24, wherein,

Y is H, NH₄, or NR₄, wherein R is any aliphatic hydrocarbon chain,

X is P, S, or C,

R₁ is any alkyl, alkyl ester, or fluorinated alkyl esters, R₁ having from 8 to 20 carbon units,

n is 1 when X is C or S or when X is P and the compound describes phosphinic acid or di-acid phosphate esters, n is 2 when X is P and the compound describes phosphinic acid or mono-acid phosphate esters,

Z is O when X is S and the compound describes sulfonic acids, Z is OH when X is P and the compound describes di-acid phosphate esters or phosphinic acids, and m is 1,

m is 0 when X is C or X is P and the compound describes mono-acid phosphates or phosphinic acid.

26. (Original) The method of Claim 1, wherein the release agent is an ester or acid selected from the group consisting of phosphates, phosphonates, phosphonites, sulfates, sulfites and carboxylates.

27. (Original) The method of Claim 26, wherein the release agent is selected from the group consisting of monoacid phosphate esters, diacid phosphate esters, fluorinated monoacid phosphate esters, fluorinated diacid phosphate esters, perfluorododecanoic acid, octyl phosphinic acid, and perfluorinated alkyl phosphinic acid.

28. (Original) The method of Claim 1, wherein the release agent is used as an external release agent.

29. (Original) The method of Claim 1, wherein the resin mixture comprises an epoxy or an isocyanate.

30. (Original) The method of Claim 1, wherein the resin mixture comprises a compound selected from the group consisting of isophorone diisocyanate, 1,6-hexamethylene diisocyanate, xylylene diisocyanate, bis(4-isocyanatocyclohexyl) methane, cyclohexane diisocyanates, toluene diisocyanate, tetramethylxylylene diisocyanate methylene bis(cyclohexylisocyanate), bis 3,4 epoxy cyclohexylmethyl adipate, 3,4 epoxy cyclohexylmethyl-3'-cyclohexenylmethyl adipate and diallyl diglycol carbonate.

31-37. (Canceled)

38. (Previously presented) A method of using a float glass mold having a SnO₂ surface, comprising:

treating the mold with a solution comprising an anionic release agent having a negative charge, wherein the solution has a pH that induces a positive charge on the SnO₂ surface to attract and to bond the release agent to the SnO₂ surface.

39. (Original) The method of Claim 38, further comprising the step:
providing a mold formed from the float glass.

40. (Original) The method of Claim 38, further comprising the step:
providing a urethane resin in the mold and curing the resin.

41. (Original) The method of Claim 38, further comprising the step:
providing an epoxy resin in the mold and curing the resin.

42-43. (Canceled)

44. (Currently amended) A method for making castings from oxide-coated molds,
comprising:

treating a mold with a solution comprising a release agent, wherein the solution has a pH
that induces an attracting force on an oxide surface of the mold to bond the release agent to the
surface, and using said treated mold to shape curable resin to provide a casting from said treated
mold.

45. (Previously presented) A method for making articles cast from molds,
comprising:

treating a mold having at least one oxide-coated surface with a solution comprising an
ionic release agent having a charge, wherein the solution has a pH that induces the opposite
charge on the oxide surface to bond the release agent to the surface;

providing resin in the mold; and

curing the resin.